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**ASSIGNMENT BOOKLET 1B**

SCN1285 Science 14
Module 1: Section 3 Assignment and Section 4 Assignment

| FOR STUDENT USE ONLY | |
|---|---|
| Date Assignment Submitted: _____ | (If label is missing or incorrect) Student File Number: _____ |
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**Teacher's Comments**

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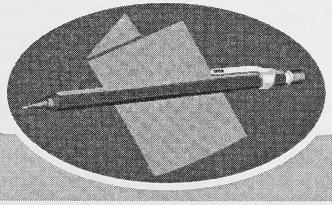
# Science 14

## Module 1

# Investigating Properties of Matter

## Assignment Booklet 1B



Learning Technologies Branch

Alberta LEARNING

## FOR TEACHER'S USE ONLY

### Summary

| | Total Possible Marks | Your Mark |
|---|---|---|
| Section 3 Assignment | 33 | |
| Section 4 Assignment | 46 | |
| | 79 | |

### Teacher's Comments

Science 14
Module 1: Investigating Properties of Matter
Assignment Booklet 1B
Section 3 Assignment and Section 4 Assignment
Learning Technologies Branch
ISBN 0-7741-2493-8

**The Learning Technologies Branch acknowledges with appreciation the Alberta Distance Learning Centre and Pembina Hills Regional Division No. 7 for their review of this Assignment Booklet.**

| This document is intended for | |
|---|---|
| Students | ✓ |
| Teachers | ✓ |
| Administrators | |
| Home Instructors | |
| General Public | |
| Other | |

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# ASSIGNMENT BOOKLET 1B
# SCIENCE 14: MODULE 1
# SECTION 3 ASSIGNMENT AND SECTION 4 ASSIGNMENT

Your mark for this module will be determined in part by how well you do your assignments.

This Assignment Booklet is worth 79 marks out of the total 155 marks for the assignments in Module 1. The value of each assignment and each question is stated in the left margin.

Work slowly and carefully. If you have difficulty, go back and review the appropriate topic.

Be sure to proofread your answers carefully.

## Section 3 Assignment: Mixtures and Their Uses

(33)

**Read all parts of your assignment carefully and record your answers in the appropriate places.**

For questions 1 to 5, read each statement carefully. Decide which of the choices BEST completes the statement or answers the question. Place your answer in the blank space given.

(1) _____ 1. Which of the following is a mechanical mixture?

A. shampoo
B. chocolate chip cookie dough
C. tap water
D. air

(1) _____ 2. Which of the following is a solution?

A. concrete
B. sand and water
C. orange juice
D. apple juice

(1) _____ 3. Sugar and water are mixed to form a solution. The solute is

A. sugar
B. water
C. both sugar and water
D. none of the above

(1) _____ 4. The solvent of a solution is defined as

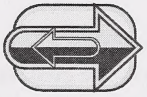
A. the non-dissolved particles
B. the substance that dissolves
C. the substance into which something is dissolved
D. the substance that remains in a filter after the solution is filtered

(1) _____ 5. You can recognize a solution because

A. it is always colourless
B. you can see the particles in it
C. you can see only one type of substance
D. it is always a solid

(1) 6. In a solution of 5 mL of baking soda and 250 mL of water, the solvent is

_____.



Return to page 54 of the Student Module Booklet and begin Lesson 2.

For questions 7 to 14, read each statement carefully. Decide which of the choices BEST completes the statement or answers the question. Place your answer in the blank space given.

(1) _____ 7. A substance that will dissolve in a solvent is said to be

A. concentrated
B. insoluble
C. filtered
D. soluble

(1) _____ 8. A substance that is soluble in water is

A. gasoline
B. salt
C. oil
D. petroleum jelly

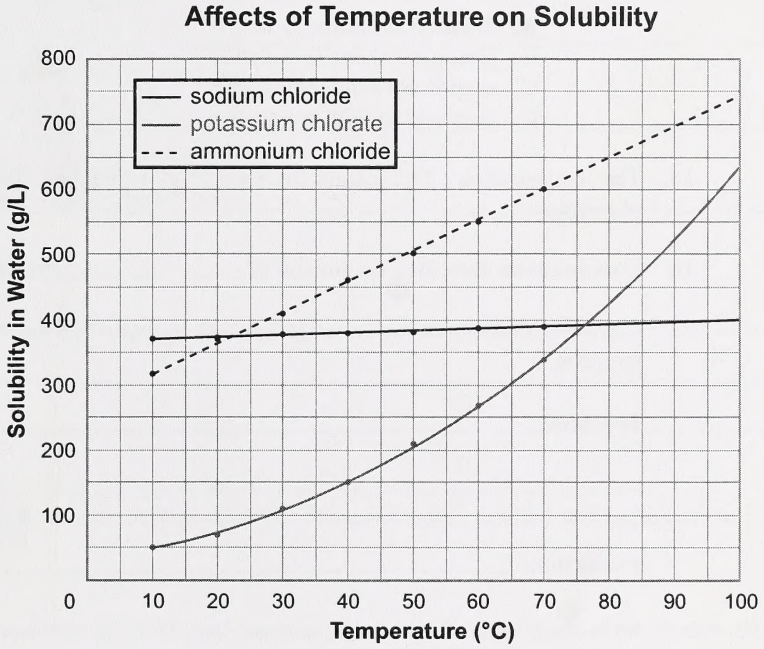
(1) _____ 9. A substance that is insoluble in water is

A. corn oil
B. sugar
C. baking soda
D. salt

(1) _____ 10. Which statement is true about solubility and temperature?

A. The solubility of a solute decreases as temperature increases.
B. The solubility of a solute increases as temperature increases.
C. The solubility of a solute increases as temperature decreases.
D. The solubility of a solute stays the same as temperature increases.

**Use the following graph to answer questions 11 to 13.**




(1) _____ 11. Which solute has the lowest solubility at 60°C?

A. sodium chloride
B. potassium chlorate
C. ammonium chloride
D. both A and B

(1) _____ 12. Ammonium chloride has a solubility of about 400 g/L at

A. 27°C
B. 37°C
C. 77°C
D. 95°C

(1) _____ 13. Which substance's solubility does not seem affected much by temperature change?

A. ammonium chloride
B. potassium chlorate
C. sodium chloride
D. both A and C

(1) _____ 14. Soap helps remove grease from clothes because

A. grease is insoluble in soap
B. grease is soluble in water
C. soap is not soluble in water
D. grease is soluble in a soap and water solution

(1) 15. The concentration 12 g/L means there are 12 g of solute present in _____ of solution.

(1) 16. Concentration describes the amount of _____ present in a solution.

17. Complete a lab report for Investigation 3-B on page 48 of the textbook using the following template.

(1) **Problem:** _____

_____

(2) **Prediction:** _____

_____

(4) **Observations:**

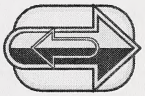
| Test | Dissolved Without Heating | Dissolved with Heating |
|---|---|---|
| water and petroleum jelly | | |
| water and salt | | |
| vegetable oil and petroleum jelly | | |
| vegetable oil and salt | | |

(2) **Conclusion:**

_____

_____

_____



Return to page 60 of the Student Module Booklet and begin Lesson 3.

For questions 18 to 22, read each statement carefully. Decide which of the choices BEST completes the statement or answers the question. Place your answer in the blank space given.

(1) _____ 18. The separation technique you used in the investigation to make dirty water clear is

A. filtration
B. distillation
C. sedimentation
D. crystallization

(1) _____ 19. The process used to collect salt from a salt-water solution is called

A. filtration
B. distillation
C. sedimentation
D. crystallization

(1) _____ 20. A process by which water can be cleaned by boiling and then collecting the steam is called

A. filtration
B. distillation
C. sedimentation
D. crystallization

(1) _____ 21. A window screen can be fitted to the bottom of a box frame and used to separate which of the following?

A. a solution
B. a mechanical mixture
C. a solute from a solvent
D. bacteria from water

(1) _____ 22. Which substance that sticks to bacteria, viruses, and tiny dirt particles, causing them to settle to the bottom, is used in water purification?

A. chlorine
B. sand
C. alum
D. fluorine

(2) 23. The air you breathe is a solution of about 78% nitrogen and 21% oxygen and 1% other gases. Which substance is the solvent? Explain how you know.

_____

_____

_____

(1) 24. The following steps are used to separate a mixture of sugar, sand, and nails. List the letter of steps in the order they should be completed.

A: Use a filter to separate the sand from the solution.
B: Separate the nails from the mixture using a magnet or sieve.
C: Heat the solution to evaporate the water and crystallize the sugar.
D: Mix water with the sand and sugar.

_____

Return to page 66 of the Student Module Booklet and begin Section 4.

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## Section 4 Assignment: Solutions and the Environment

**Read all parts of your assignment carefully and record your answers in the appropriate places.**

For questions 1 to 6, read each statement carefully. Decide which of the choices BEST completes the statement or answers the questions. Place your answer in the blank space given.

(1) _____ 1. You mix 15 g of sugar in enough water to make 1 L of solution. The concentration of this solution is

A. 1 L/15 g
B. 1.5 g/L
C. 15 g/L
D. 15 L

(1) _____ 2. Which one of the following products is concentrated?

A. canned pop
B. drink crystals
C. chocolate milk
D. whole milk

(1) _____ 3. Every day, each person in Canada throws out about 2.2 kg of garbage. If the population of Canada is 31 900 000, the total mass of garbage that all Canadians throw out each day is

A. 2.2 kg
B. 15 500 000 kg
C. 31 900 000 kg
D. 70 180 000 kg

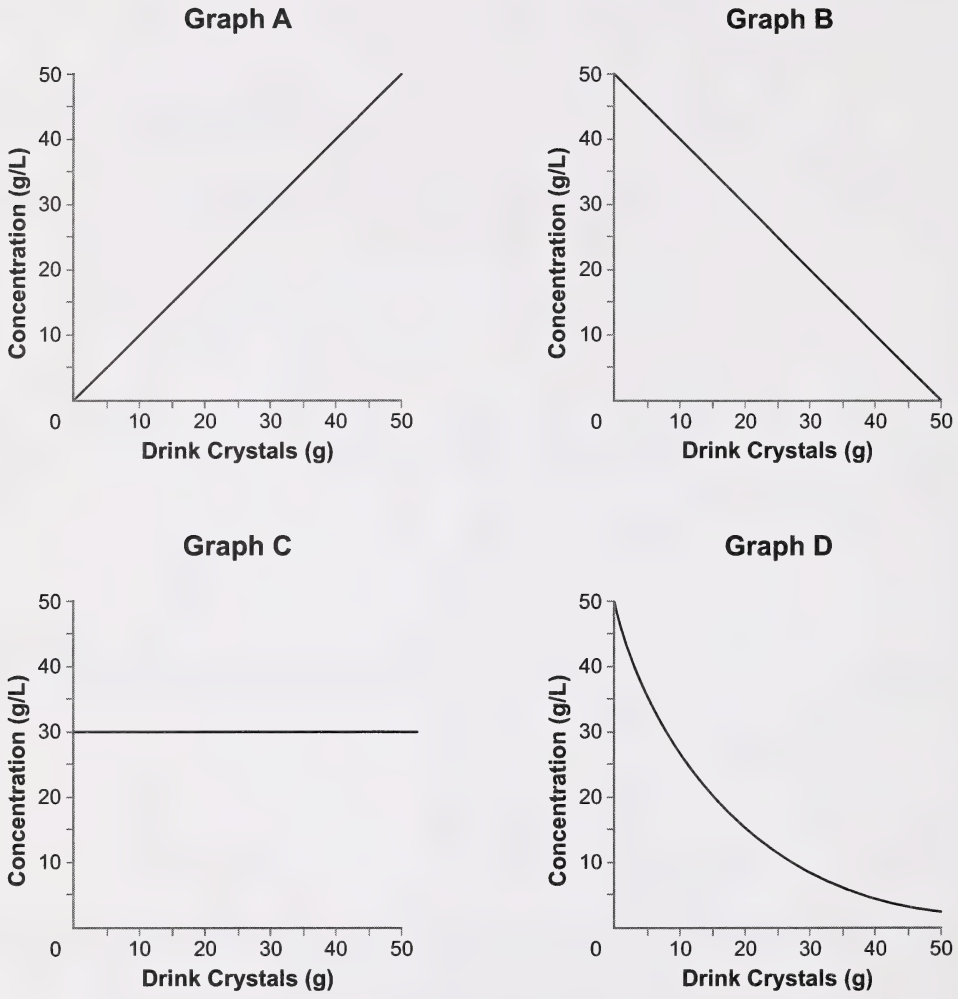
(1) _____ 4. When making JELL-O®, you mix the crystals in hot water first; then you add cold water and put in the refrigerator to set. Which is the best reason for mixing JELL-O® crystals in hot water first?

A. JELL-O® will taste better.
B. Cold water will affect the colour of the JELL-O®.
C. The JELL-O® will set instantly if cold water is used.
D. The hot water dissolves the JELL-O® crystals more quickly and thoroughly.

(1) _____ 5. Many manufacturers have developed concentrated products. One reason for using concentrated products is

A. the size of the package will be larger
B. the size of the package will be smaller
C. the cost of the packaging will be higher
D. the overall cost of the product will be higher

**Use the following graphs to answer question 6.**




(1) _____ 6. The graph that shows a solution becoming more concentrated is

A. Graph A
B. Graph B
C. Graph C
D. Graph D

7. You have a 400-mL beaker with 100 mL of water. You add two sugar cubes to the water.

(1) a. The concentration of the solution (in sugar cubes/unit volume of water) is

_____.

(1) b. The solute is the _____.

(1) c. The solvent is the _____.

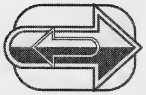
(1) d. If you add two more sugar cubes, what is the concentration of the solution in terms of sugar cubes per unit volume of water?

_____

(2) e. Explain how you can change the concentration of the solution in question 7.d. back to the concentration of the solution in question 7.a.

_____

_____



Return to page 72 of the Student Module Booklet and begin Lesson 2.

For questions 8 to 12, read each statement carefully. Decide which of the choices BEST completes the statement or answers the question. Place your answer in the blank space given.

(1) _____ 8. A solution with a pH that is less than 7 indicates a(n)

A. base
B. acid
C. salt
D. neutral solution

(1) _____ 9. A substance turns blue litmus paper red. This substance is most likely?

A. lemon juice
B. baking soda
C. ammonia
D. milk of magnesia

(1) _____ 10. An unknown sample was tested with red and blue litmus paper. The red litmus turned blue and the blue litmus stayed blue. What does this say about the sample?

A. The sample is neutral.
B. The sample is an acid.
C. The sample is a base.
D. More testing needs to be done.

(1) _____ 11. Two household substances that are acids are

A. tomatoes and milk
B. apples and Rolaids®
C. vinegar and distilled water
D. lemon juice and baking soda

(1) _____ 12. Which statement is correct?

A. Red cabbage juice turns red in an acid and purple in a base.
B. Red cabbage juice turns green in an acid and purple in a base.
C. Red cabbage juice turns red in an acid and green in a base.
D. Red cabbage juice turns yellow in an acid and red in a base.

(6) 13. Complete the following table. The first one is completed for you.

| Substance | pH | Acid or Base? | Reason |
|---|---|---|---|
| tomatoes | 4.2 | *acid* | *pH less than 7* |
| lye | 13.8 | | |
| stomach fluid | 2.0 | | |
| bananas | 5.2 | | |
| milk of magnesia | 10.5 | | |
| ammonia | 11.1 | | |
| eggs | 7.8 | | |

14. Three different household solutions are tested with universal pH paper. Use the words *neutral*, *acid*, or *base* to describe each solution.

(1) a. Solution A; pH = 12: _____

(1) b. Solution B; pH = 7: _____

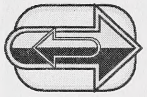
(1) c. Solution C; pH = 5: _____

(3) 15. Three common household solutions are tested with both red and blue litmus paper. Predict the colour change of each litmus paper in each solution.

| Solution | pH | Red Litmus | Blue Litmus |
|---|---|---|---|
| A | 2.5 | | |
| B | 7.0 | | |
| C | 8.3 | | |

(2) 16. Two food samples are tasted. Tell whether this food is an acid or a base.

| Food | Taste | Acid/Base |
|---|---|---|
| A | bitter | |
| B | sour | |



Return to page 80 of the Student Module Booklet and begin Lesson 3.

For questions 17 to 22, read each statement carefully. Decide which of the choices BEST completes the statement or answers the question. Place your answer in the blank space given.

(1) _____ 17. Neutralization occurs when an acid is combined with a base. Which of the following is an example of neutralization?

A. adding an acid to water
B. using an antacid to treat heartburn
C. washing hair with a low pH shampoo
D. making soap

(1) _____ 18. Which of the following is not a property of an acid?

A. is corrosive
B. conducts electricity
C. neutralizes acids
D. reacts with metals

(1) _____ 19. Which substance corrodes steel wool the **most**?

A. salt
B. acid
C. base
D. tap water

(1) _____ 20. Sponge toffee is made by mixing sugar, corn syrup, vinegar, and baking soda. The reason bubbles form in the sponge toffee is

A. corn syrup produces bubbles when heated
B. sugar and vinegar produce a gas that creates the bubbles
C. mixing produces the bubbles by bringing air into the mixture
D. vinegar and baking soda react to produce carbon dioxide, which forms the bubbles

(1) _____ 21. Which of the following is the best way to clean up an acid spill?

A. Wash down the acid spill with plenty of water.
B. Wipe up the acid spill with paper towel.
C. Spread sawdust on the acid spill to absorb it.
D. Neutralize the acid spill with a base; then wash it with plenty of water.

(1) _____ 22. The metal roof of a building has turned a light green colour. The metal roof is most likely

A. aluminum
B. copper
C. silver
D. iron

23. Choose from the following terms to complete the statements correctly. Terms may be used more than once.

- salt
- sugar
- oxygen
- pH
- heat
- water
- acid rain
- base

(1) a. The substance that is the primary cause of rusting is _____.

(2) b. The two substance that speed up the process of rusting are _____ and _____.

(1) c. Acid rain is rain that has a _____ of less than 5.6.

(2) 24. Explain why you should wash your car after driving on salty, winter roads.

_____

_____

(3) 25. For each characteristic listed in the table, place a check mark ( ✓) in the column for which it applies to.

| | True for Acids Only | True for Bases Only | True for Both Acids and Bases |
|---|---|---|---|
| sour taste | | | |
| bitter taste | | | |
| speeds up corrosion of metals | | | |
| soap is an example | | | |
| can be detected with an indicator | | | |
| often corrosive to skin | | | |

**Submit your completed Assignment Booklet 1B to your teacher for assessment.**
Then return to page 86 of the Student Module Booklet and read the Module Summary.

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